

Ecological Patterns in CRES Reef Fish Data



Overview

- Study Approach and Pattern Questions
- Study design
- Sampling methodology
- Results
- Conclusions



Study approach

- **CRES-interdisciplinary approach to determine role of land-based and biotic influences on reef health.**
- **Look for patterns in distribution and abundance of reef fish that can be help to determine important ecological interactions.**
- **Describe where interactions occur spatially (among reefs and across depth).**

Two General Questions

A. What role do reef fishes play in the decline of coral reefs?

1. Herbivores: algae vs. coral competition
2. Damselfish: removal of live coral tissue

B. How does coral reef condition affect the fish assemblage?

1. Density and Species Richness
2. Species patterns
3. Rugosity

Study Design

- CRES reef sites
 - Inner, mid, and shelf edge
 - 4 depth intervals:
3-5, 6-9, 10-15,
20-22 m
- Quarterly sampling



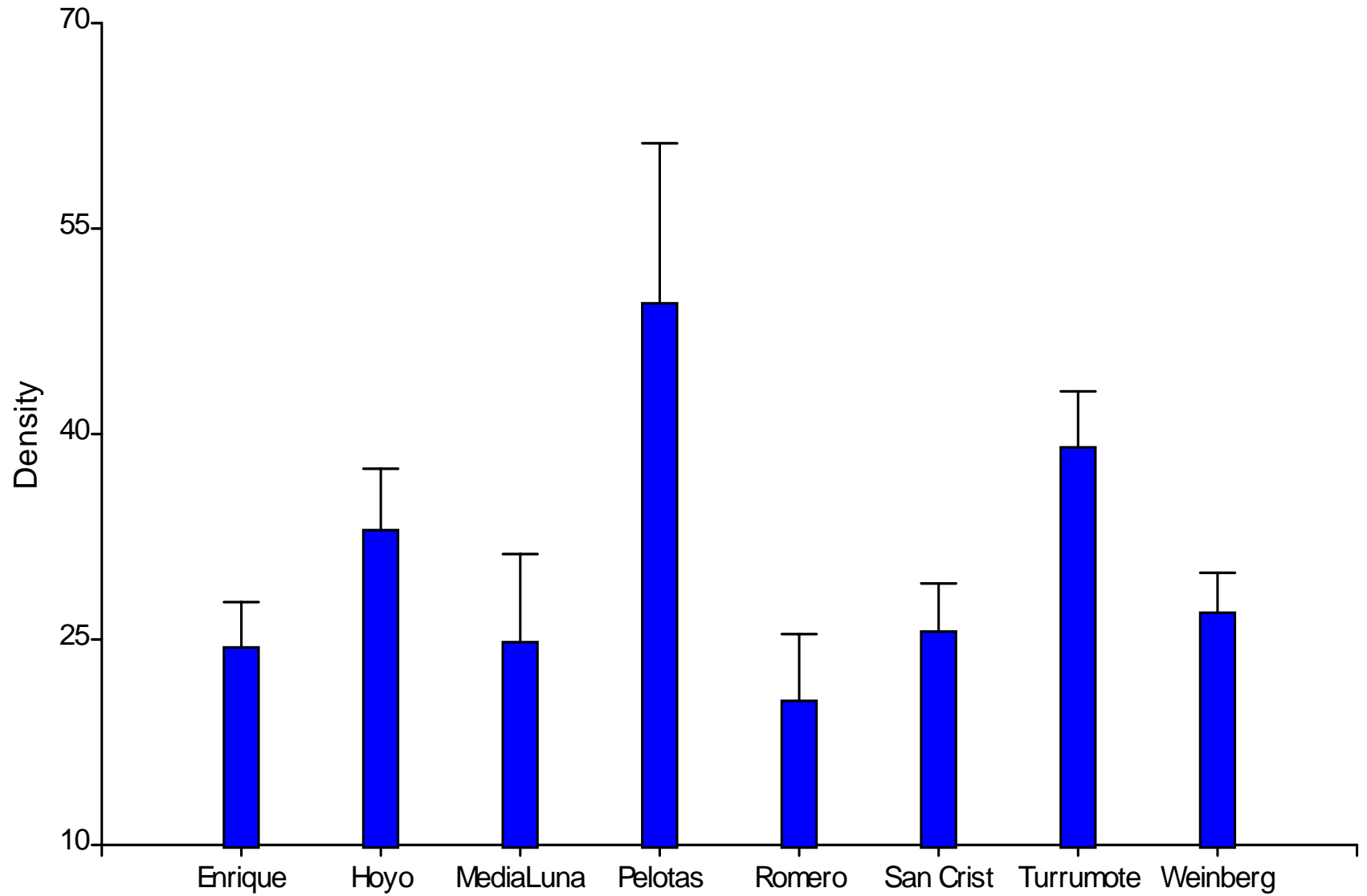
Sampling Methodology

- Visual fish census of non-cryptic, diurnal reef fish
- Enumerate species
- 25m x 4m belt transect (100m²)
- 15 minute time standard
- Estimate fork length

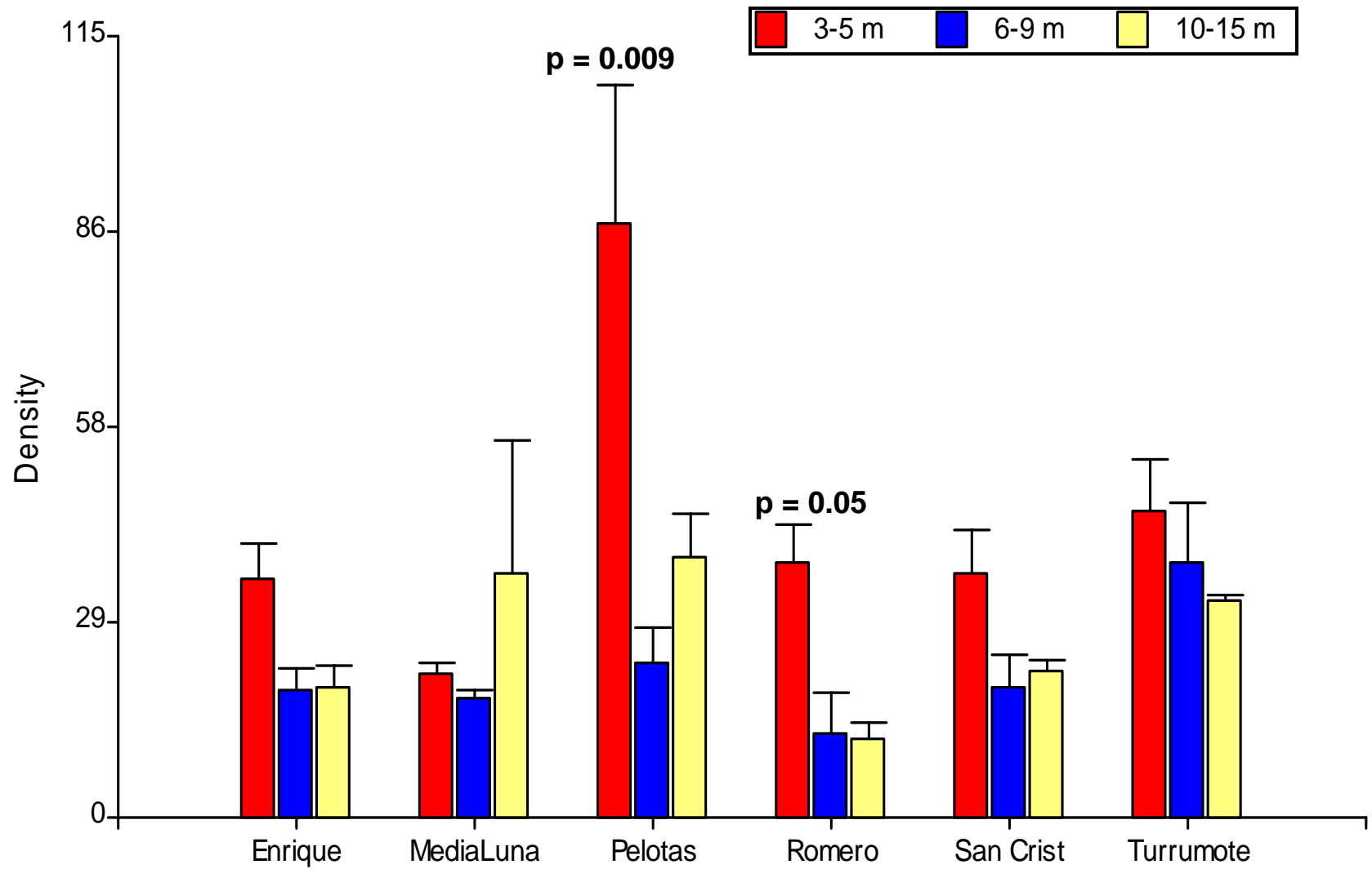


- Length used to calculate biomass

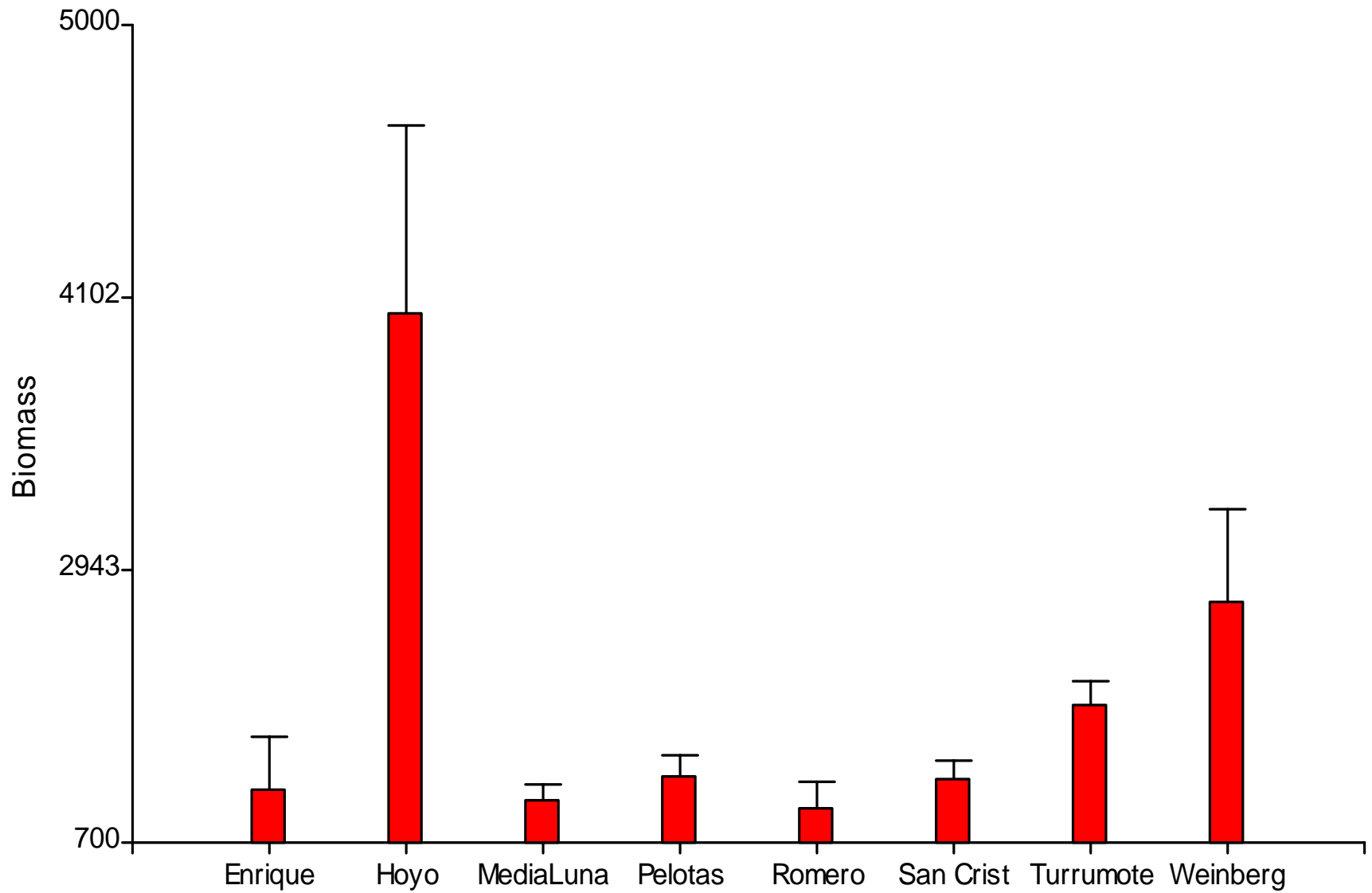
Herbivores



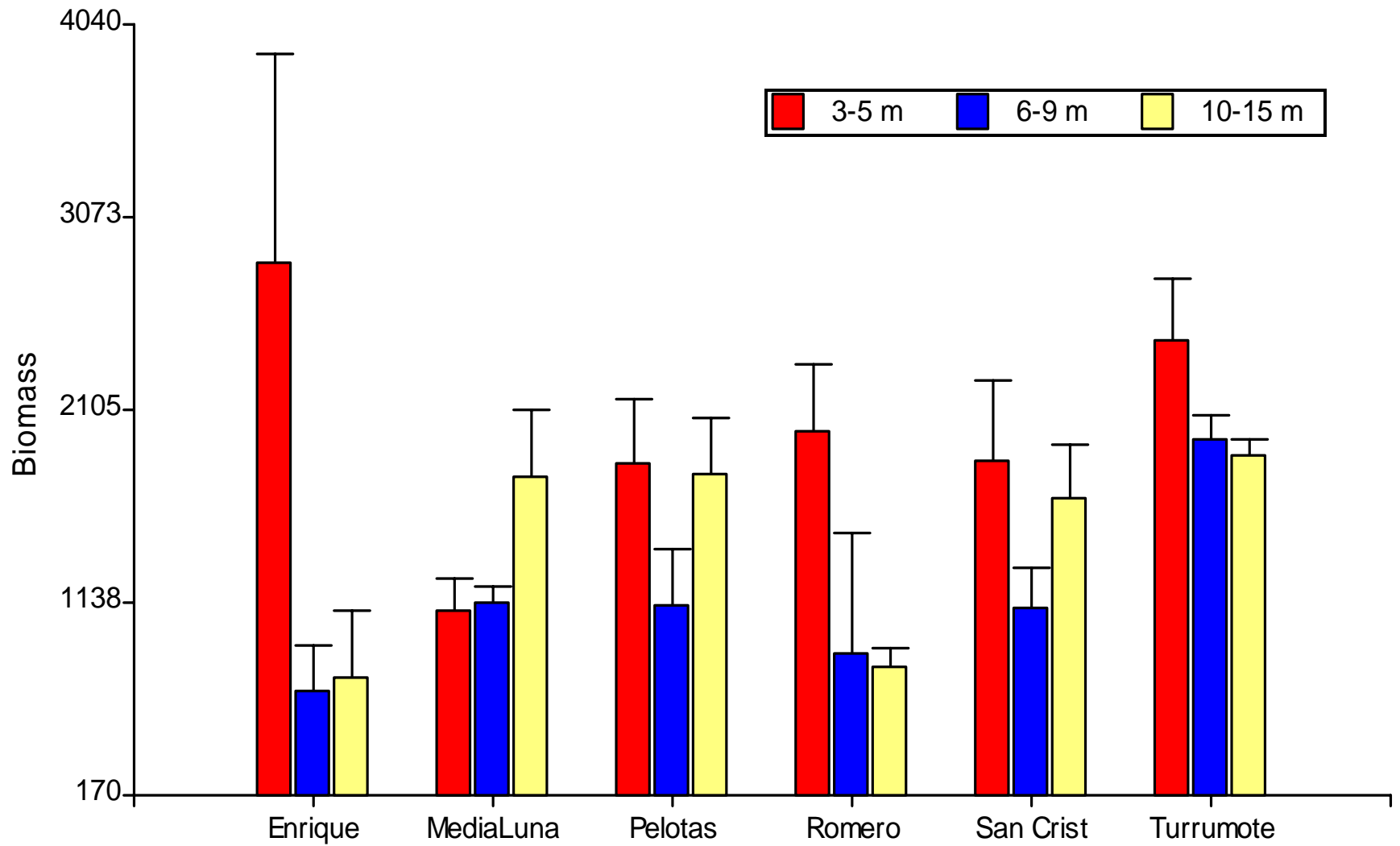
Herbivores



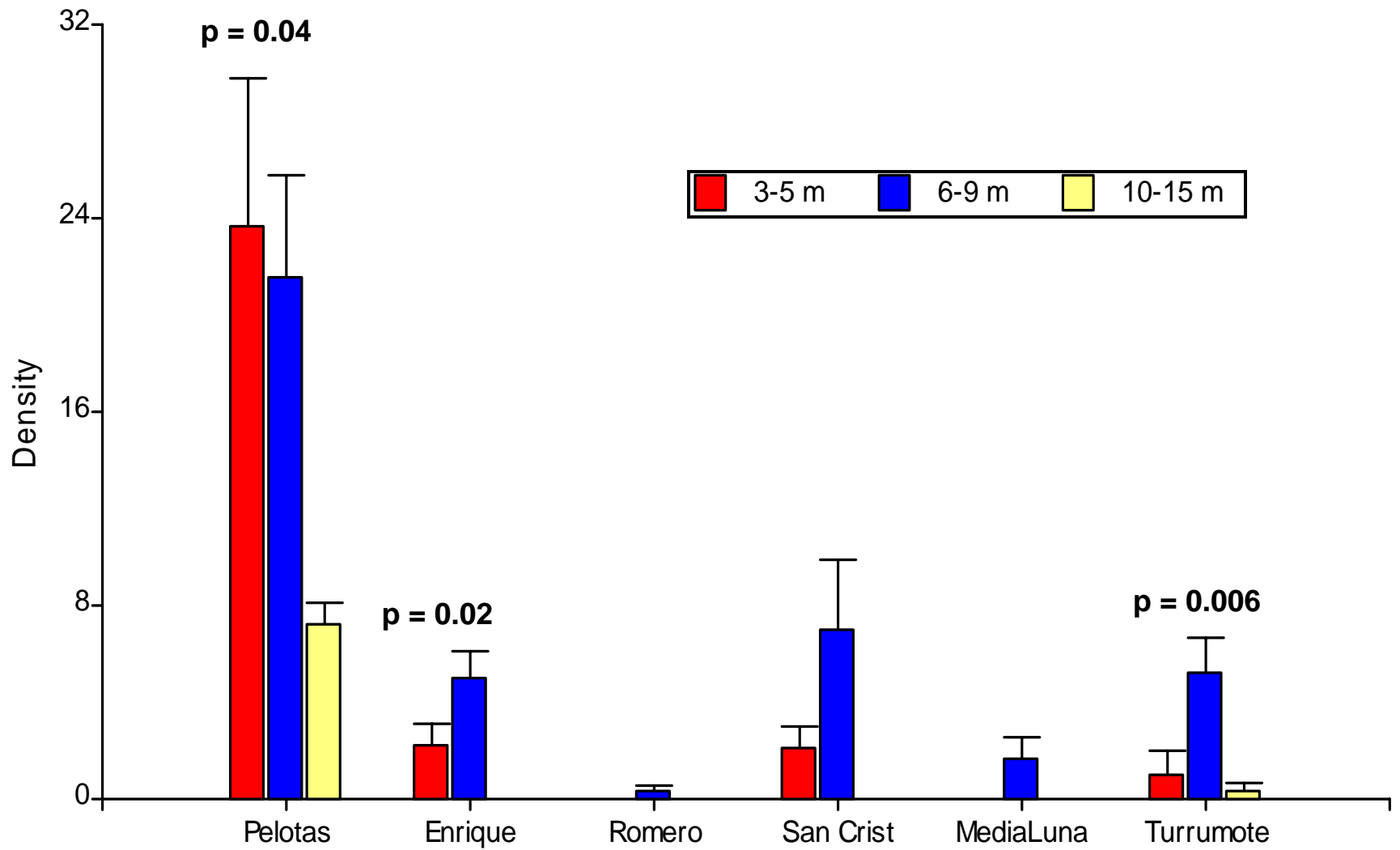
Herbivores



Herbivores

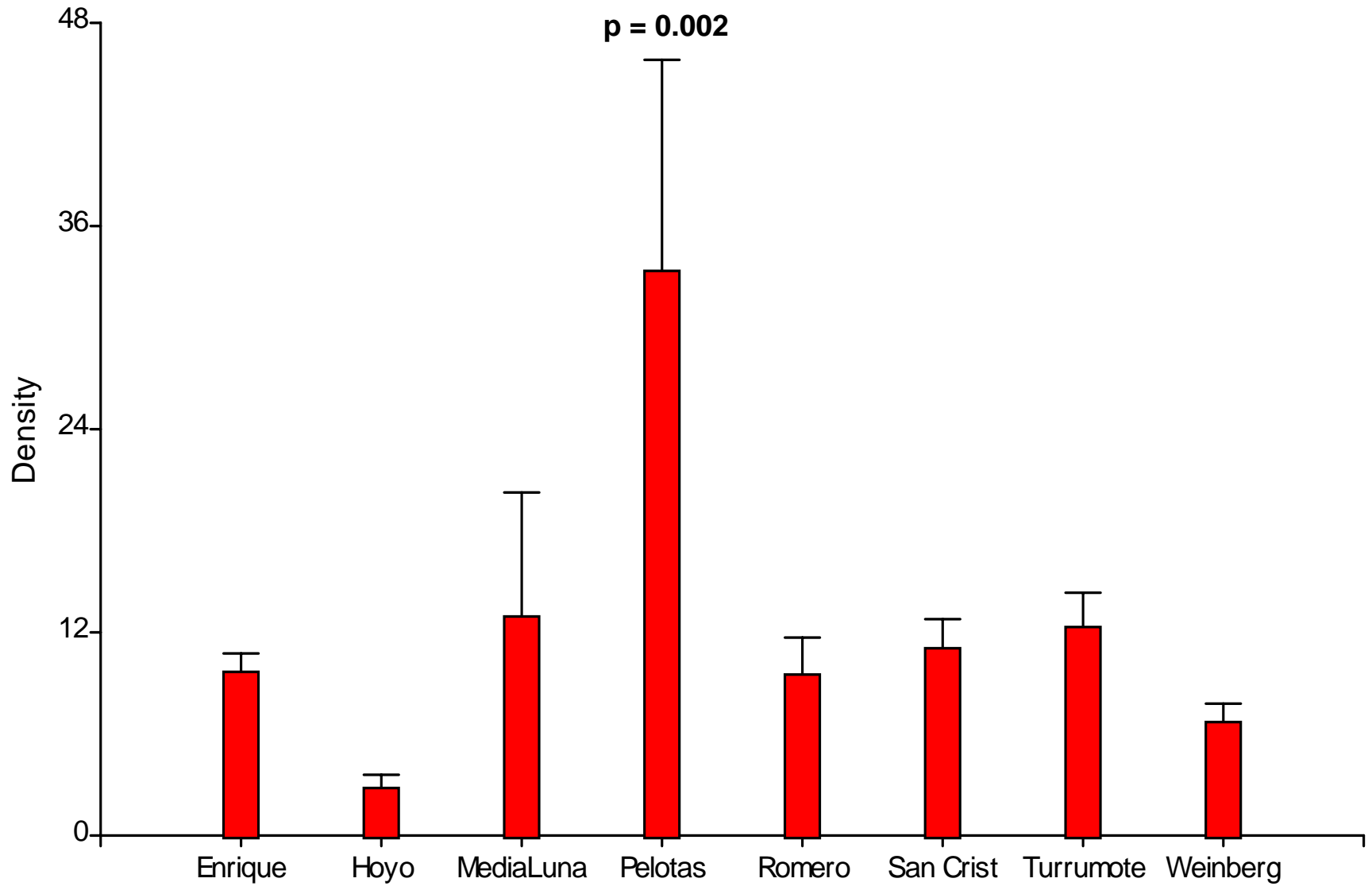


S. planifrons

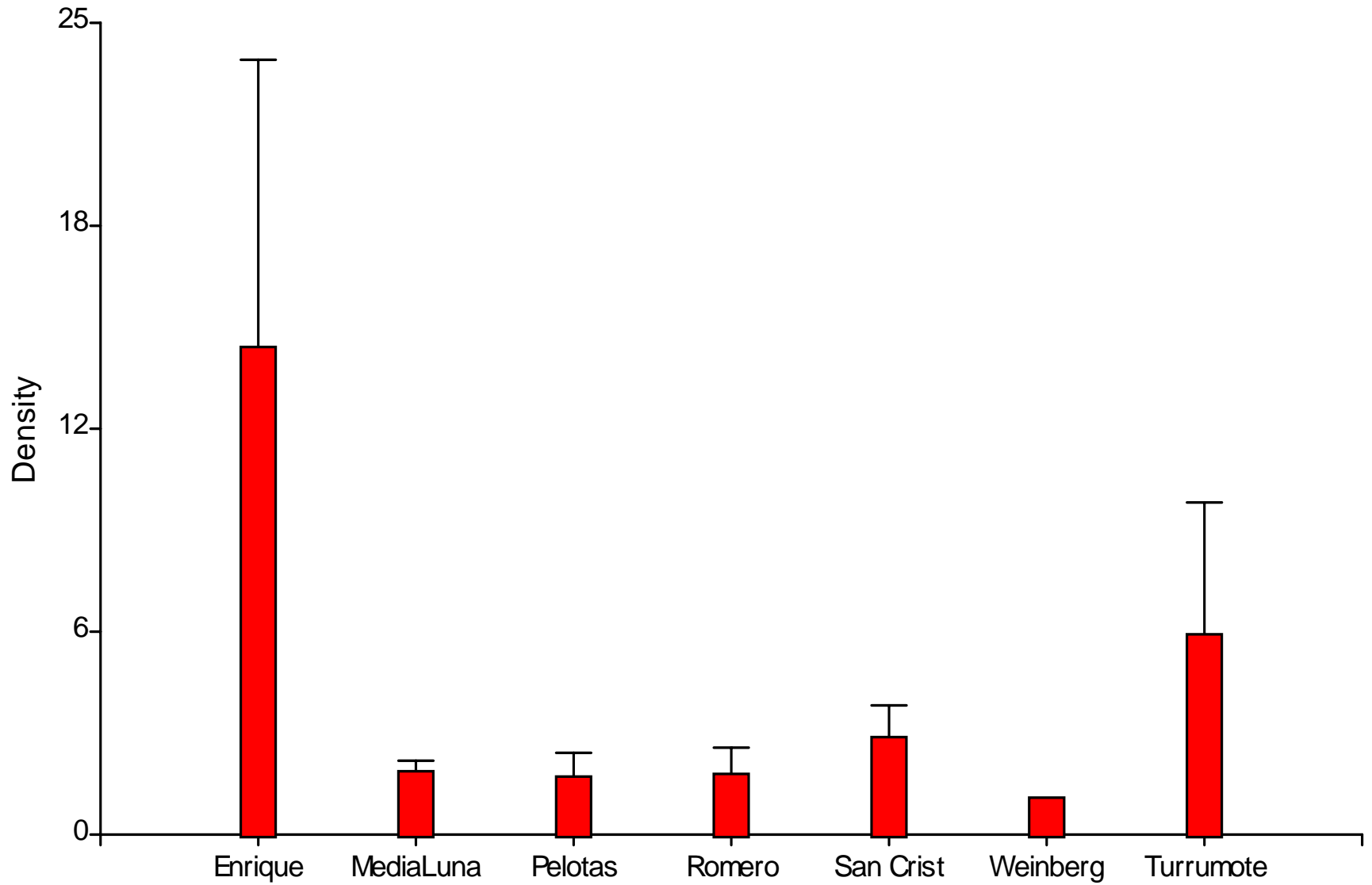


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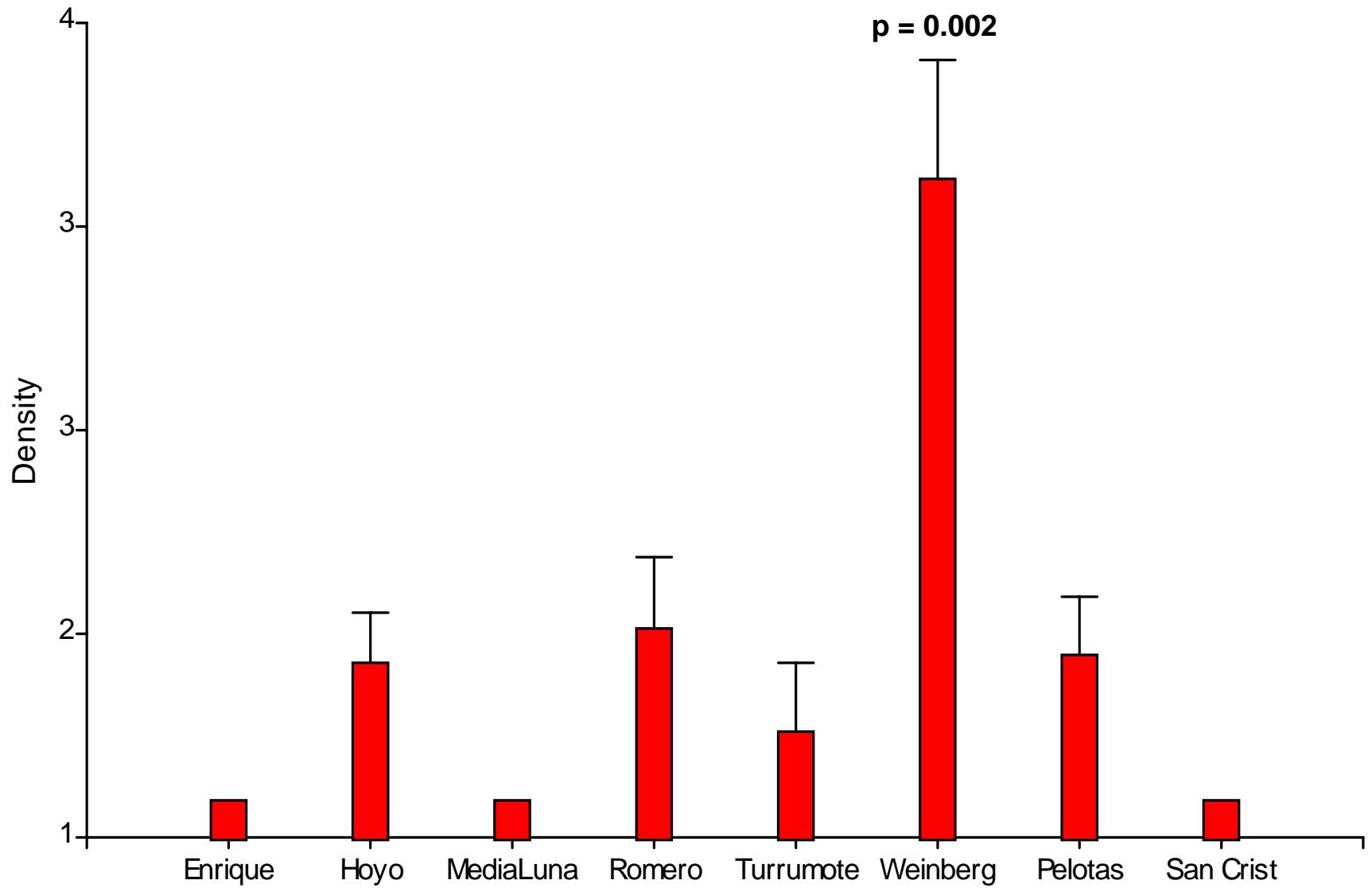
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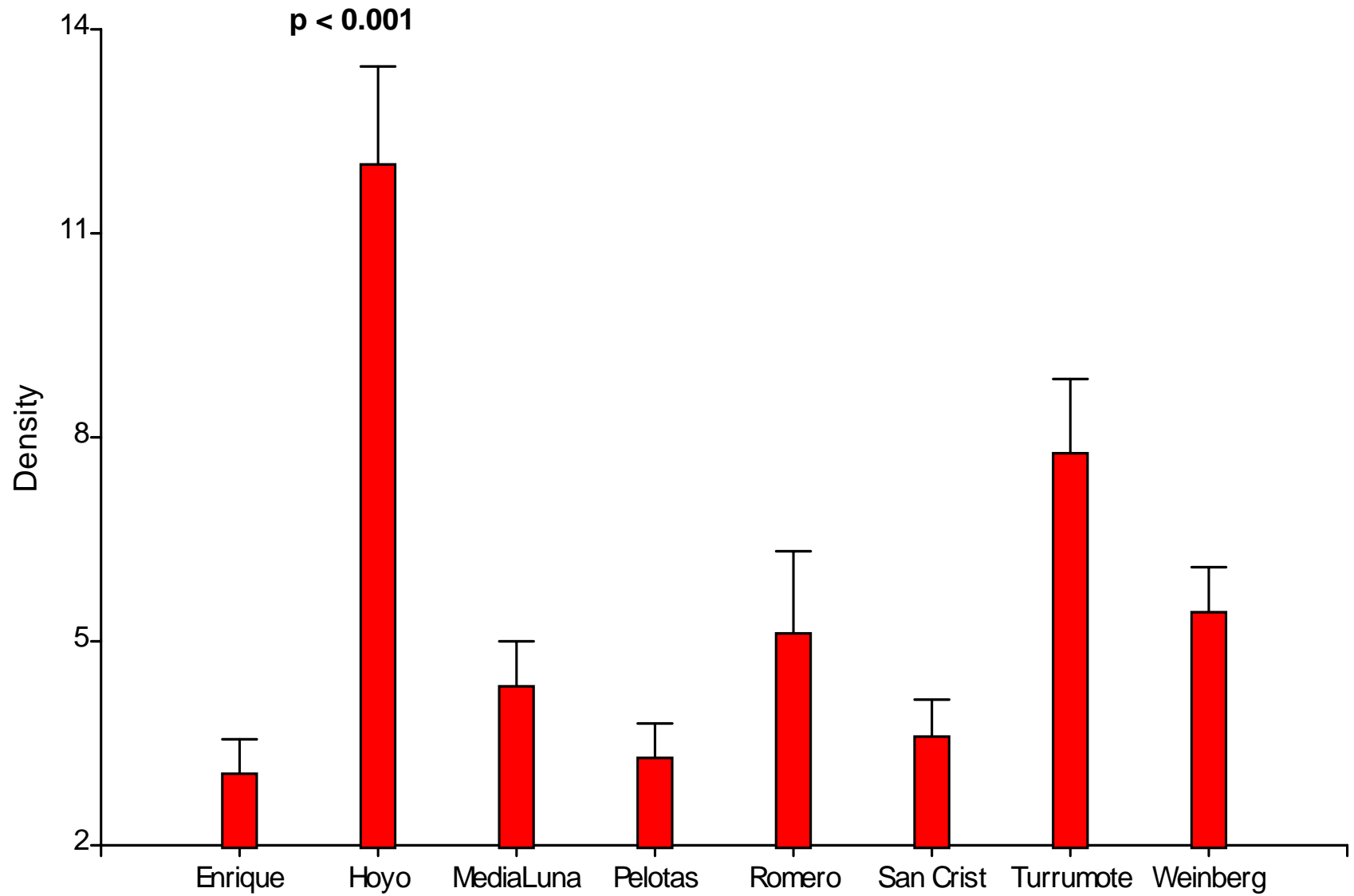
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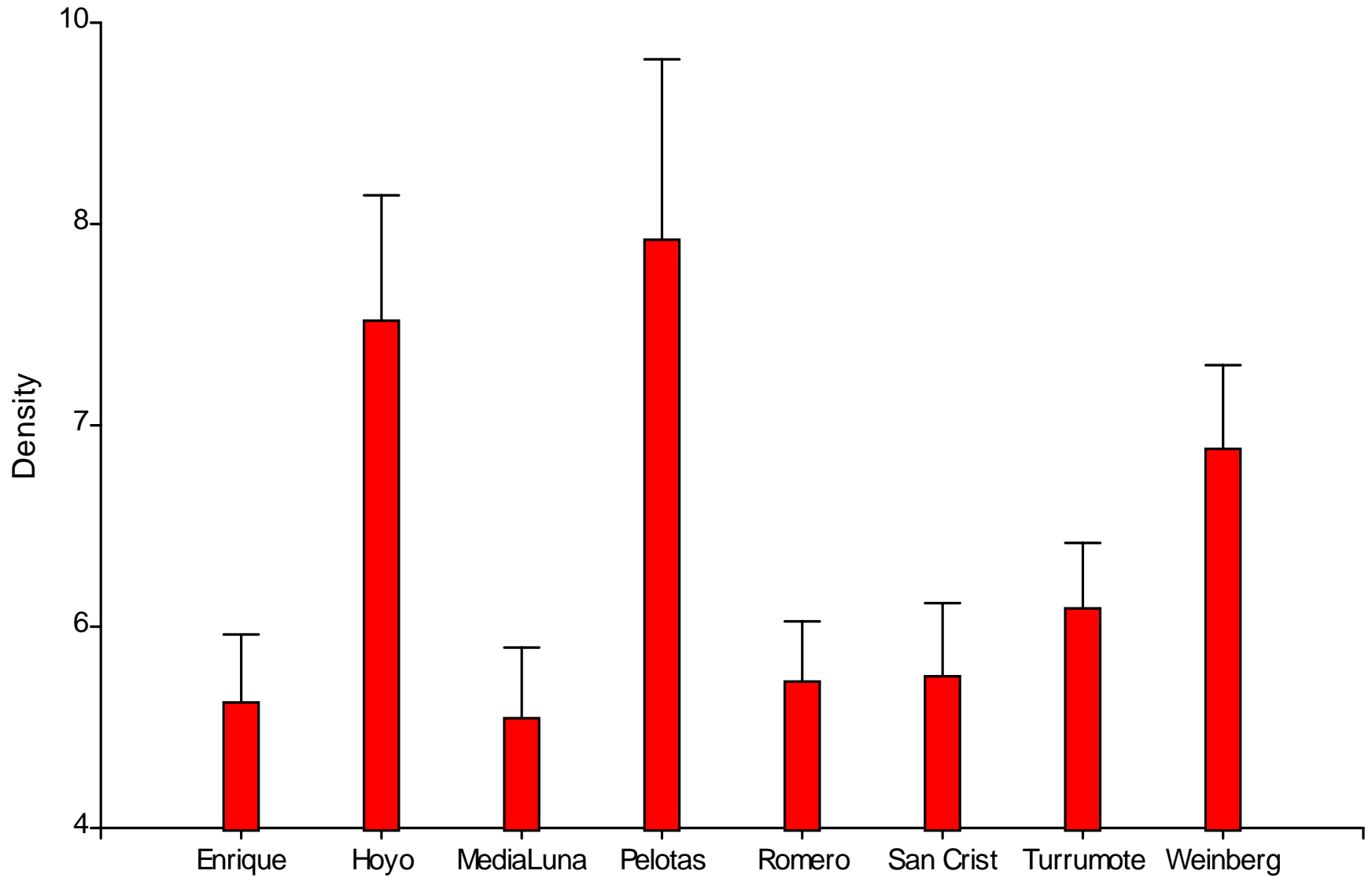
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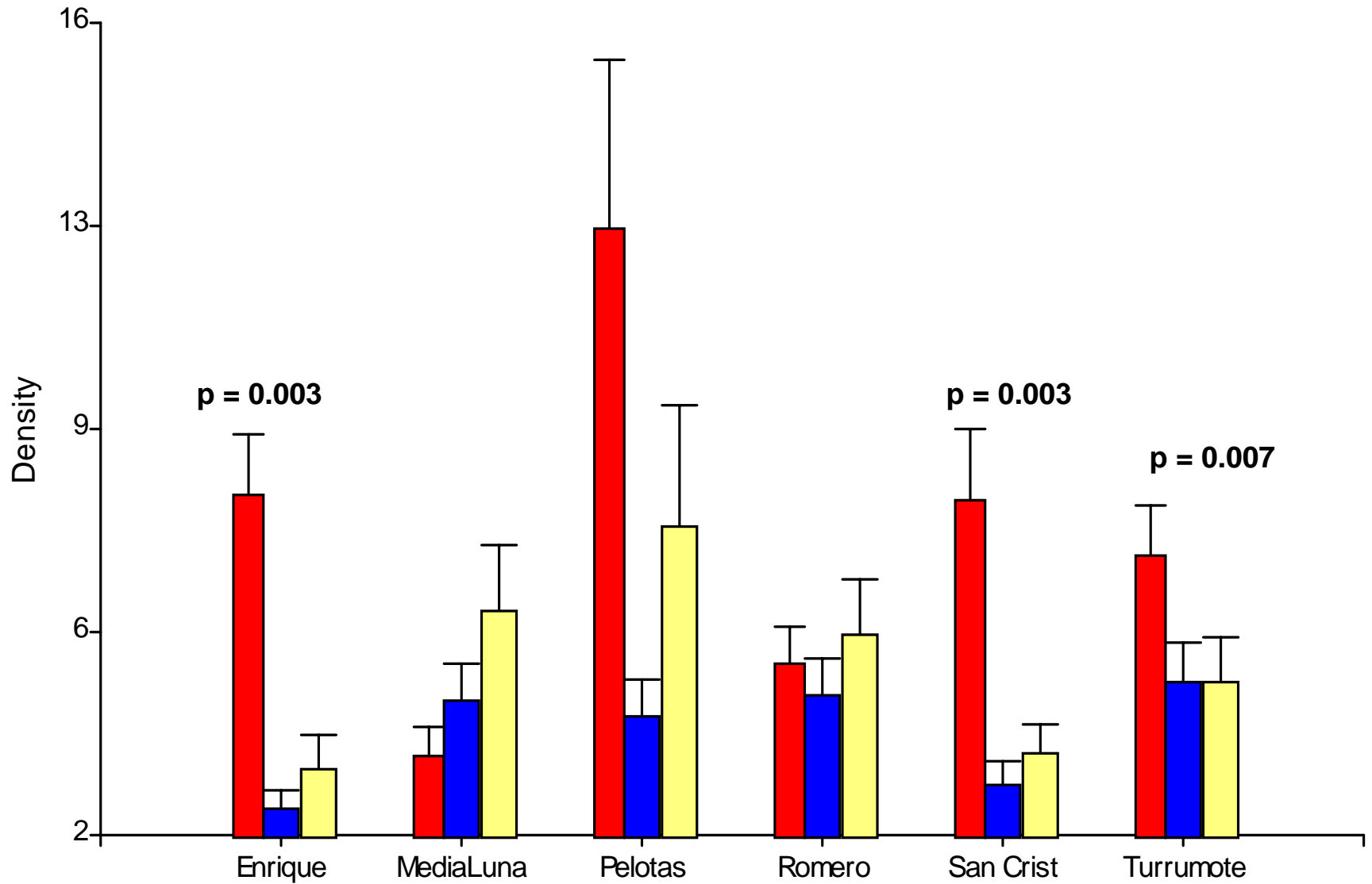
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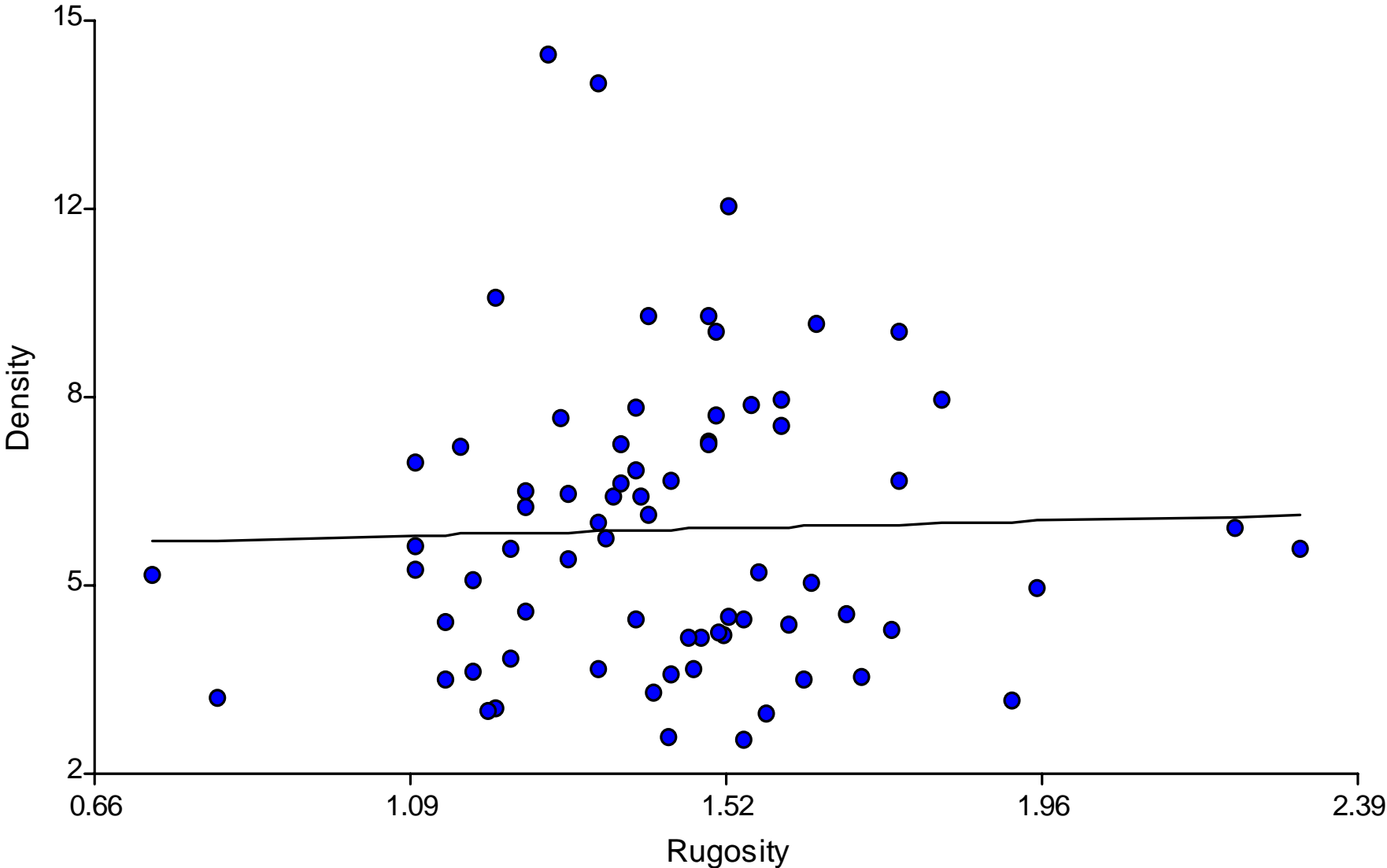
All species pooled



All species



Linear Regression



Conclusions

- Herbivore density between reefs not significantly different
- Higher herbivore density at shallow depths at Pelotas and Romero Reefs
- *S. planifrons* density 3 times higher at Pelotas
- Higher density of *S. planifrons* at mid depths at Enrique and Turrumote Reefs
- Individual species revealed patterns that may be due to patchy habitat
- No pattern observed among reefs (inshore/offshore)
- Density estimates for all species pooled is higher at shallow depths (Enrique, San Cristobal and Turrumote)
- No relationship was observed between rugosity and overall density